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of value in connection with the general problem of group psychology.

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*Department of Zoology, University of California, June 11, 1921.*

### GENERA AND SPECIES

By RICHARD C. MCGREGOR

I HAVE read with much interest and appreciation the article by Witmer Stone on the use and abuse of the genus<sup>1</sup>. Briefly stated, Doctor Stone's protest is against the excessive division of genera that has been proposed by some recent authors; he suggests that we use the broader generic divisions of a few years ago for nomenclatural purposes, restricting the finer superspecific divisions to occasions when such distinctions are required. This subject erupts more or less periodically<sup>2</sup>, and one might derive some entertainment from a study of its cycle and predict the year of the next activity.

As ornithological nomenclature has been one of the chief sufferers from the abuse described by Doctor Stone, it would be appropriate for the *Condor* and other leading ornithological journals to publish comment on this subject. Therefore, a few words are offered for the sake of provoking discussion.

The general tendency, in ornithology at least, is to recognize finer and more trivial characters and, accordingly, to break up old groups and to name more families, genera, etc. With ever-increasing collections and the more intensive study of specimens, the systematist inevitably recognizes differences that escaped detection before, and exaggerates the significance of minor differences. The result is that the genus must be based upon slighter characters than formerly; the rank of the group is thus degraded. This may lead to a condition in which each species of a family is the representative of a genus, the interrelations of the species are no longer indicated, and the generic names become absolutely worthless.

The groups of taxonomy are imaginary and have no existence in nature.

<sup>1</sup>Science, vol. 51, 1920, p. 427.

<sup>2</sup>For example, note the activity of about five years ago, indicated by Sumner, F. B., Science, vol. 41, 1915, p. 899; Van Name, W. G., Science, vol. 42, 1915, p. 187; Colton, H. S., tom. cit., p. 307; Allen, J. A., tom. cit., p. 492.

The limits of a group can be stated only in relative terms. A species is one kind of an organism, but the degree or the quality of difference that shall separate one species from another cannot be stated. A genus is a group of closely related species, but no one can say how closely they must be related. Even the individual is but a phase in the great organic stream and is intimately connected with its parents and its offspring. If we had before us all of the expressions of life that have been, who could venture to designate genera and species? When we say that a species is well marked, we mean that we are ignorant of its close relatives, which may be living or fossil. While we are defining a species, it becomes something else. The present is gone as we say it and has become the past. In practical taxonomy, of course, we treat genera and species as if their characters were fixed, and fortunately most of the species of taxonomy differ enough so that they can be easily recognized.

I have long believed what Doctor Stone points out; namely, that we try to make our system of nomenclature do double duty and that this is an "impossible burden" or, at least, it is an attempt to force on the generic name a function for which it is not fitted. I have also had in mind to suggest exactly the remedy proposed by Doctor Stone; namely, the reduction of the weaker so-called genera to the status of subgenera. My idea is that these subgenera are useful in keys to show the grouping of species in large genera.

Some botanists follow a practice that appeals to me as being very serviceable in connection with genera containing many species; this is the use of the section, in effect the subgenus. The name of a section is placed after the specific name and is used only when it is desired to show the position of the species in the genus. An illustration of this is found in the names of the plants that are commonly called begonias. There are several hundred species assigned to the genus *Begonia*, and probably as many more remain unknown to science. The species fall into several groups that many zoologists would certainly recognize as genera. How many botanists do so I do not know, but the more conservative among them resort to the use of sections when they wish to designate a part of the genus *Begonia*. As Doctor Stone points out, this retention of generic names in the broad sense is of assistance to those who are not specialists in the particular group; at the same time much of the transferring of specific names from genus to genus is avoided. For example, begonias are so well known as cultivated ornamentals that any reader would have some conception of the kind of plants indicated by the scientific names *Begonia pseudolateralis*, *Begonia mindanensis*, and *Begonia luzonensis*. If the section names were given generic rank, the same begonias would appear as *Sphenanthera pseudolateralis*, *Petermannia mindanensis*, and *Diploclinium luzonensis*.

Another method of dealing with the subgeneric name seems to be popular with some entomologists and others—the subgeneric name is inclosed within parentheses between the generic and the specific name. For example, *Colymbus (Dytes) auritus*, for the horned grebe. This style leads to unpleasant remarks on the part of the indexer, but no one considers his convenience.

Some systematists are inclined to give little consideration to the needs of the student of anatomy, geographic distribution, or general biology. In effect they say: "Only a specialist can judge of the validity of a genus or species." The general zoologist or botanist respects the work of the taxonomist and systematist and must take the classification and nomenclature of

these workers. However, the continual shifting of names and the dividing of satisfactory groups are sure to excite strong protests. No one wishes to return to the Linnaean conception of genera, but the tendency toward the other extreme seems less attractive. Names are for the use of people who talk or write about things, and names whose meanings are frequently changed are unfitted for any purpose.

Old generic names become endeared by long familiarity, but some of them must be sacrificed to the iron law of priority. We concede present convenience for promised fixity, but are we getting it? Certainly the busy genus maker is not helping us. *Anthus*, *Buteo*, *Chaetura*, *Diomedea*, *Empidonax*, *Fringilla*, and other old generic names are associated with certain birds, and I hope these names will be with us for a long time. When such names are displaced, shifted to other genera, or otherwise modified in significance, it is difficult to accept the changes in a kindly spirit. When the changes result from giving generic rank to weak subgenera, one is inclined to doubt the value of other work of the author who proposes such changes.

The names of the birds of Europe and of North America have been worked over so carefully that they should be fairly well settled. If they are not, what hope is there for the nomenclature of the birds of Asia, Africa and South America?

*Manila, P. I., February 26, 1921.*

## A SYNOPSIS OF CALIFORNIA'S FOSSIL BIRDS

By LOYE MILLER

**D**URING the several years that have elapsed since a previous synopsis of the Pacific coast fossil birds appeared in the *Condor* (Miller, 1911), our knowledge of the ancient faunas has made considerable advancement. The present writer has been especially occupied with an extended paper on the avifauna of Rancho La Brea. It seems improbable however that this memoir will be off the press for some time to come; hence it is thought advisable to announce to those interested in the subject, some of the results of recent activity in the California field.

Since the latest general paper on the subject was published by the writer (Miller, 1912) a new bird-bearing horizon, the Upper San Pedro Pleistocene has been explored (Miller, 1914). These beds yielded sixteen species of birds none of which are extinct. Bird remains from the Pliocene of Santa Monica and of San Diego have been collected by Dr. F. C. Clark of Los Angeles. These represent some species of auklet and a goose not distinguishable from *Branta canadensis*. Mr. E. J. Porteous of Lompoc, keeping the interests of science at heart, has rescued from the commercial quarries in the Miocene diatom beds of that region some most interesting bird remains. These specimens were generously turned over to the writer by Dr. David Starr Jordan. They are found to represent a new species of shearwater, two species of gannet, and one as yet indeterminate species of shore bird. This material includes the major portion of the skeleton of each of some ten or more individuals, a fact that is readily seen to hold considerable interest when one considers that a